TABLE 1 Anatomical cortical regions of interest (ROIs) used as nodes from the ENA50 atlas and the abbreviations used in this paper.

Anatomical ROI	Abbreviation	Anatomical ROI	Abbreviation
Precentral	Precent	Middle Occipital	MidOccp
Superior Frontal	SupFrnt	Inferior Occipital	InfOccp
Orbital part of Superior Frontal	OrbSFrnt	Fusiform	Fusiform
Middle Frontal	MidFrnt	Postcentral	Pstcent
Orbital part of Middle Frontal	OrbMidFrn	Superior Parietal Lobule	SPL
Opercular part of Inferior Frontal	OpIF	Inferior Parietal Lobule	InfParLob
Triangular part of Inferior Frontal	TriIFG	Supramarginal	SuprMarg
Orbital part of Inferior Frontal	OrbIF	Angular	Angl
Rolandic Operculum	RolOper	Precuneus	Precuneus
Supplementary Motor Area	SMA	Paracentral Lobule	PCL
Olfactory	Olfac	Caudate	Caudt
Medial part of Superior Frontal	MedSupFro	Putamen	Putm
Orbital part of Medial Frontal	OrbMFrnt	Pallidum	Pldm
Straight	Rectus	Thalamus	Thal
Insula	Ins	Transverse Temporal	TransvTmp
Anterior Cingulate	AntCng	Superior Temporal	SupTmp
Middle Cingulate	MidCng	Superior Temporal Pole	SupTmpPol
Posterior Cingulate	PostCng	Middle Temporal	MidTmp
Hippocampus	Hipp	Middle Temporal Pole	MidTmpPol
ParaHippocampal	ParaHipp	Inferior Temporal	InfTmp
Amygdala	Amgdl	Cerebellum	Cblum
Calcarine	Calc	Anterior part of the Vermis	AntVrm
Cuneus	Cuneus	Posterior part of the Vermis	PosVrm
Lingual	Ling	Median part of the Vermis	CntVrm
Superior Occipital	SupOccp		

TABLE 2 Brain lobes defined by merging the relevant nodes in the ENA50 atlas and the abbreviated names used to refer to these lobes in this paper.

Anatomical ROI	Abbreviation
Frontal	Fr
Medial	Md
Basal Ganglia	BG
Cerebellum	Cb
Insula	In
Parietal	Pt
Temporal	Tp
Occipital	Oc

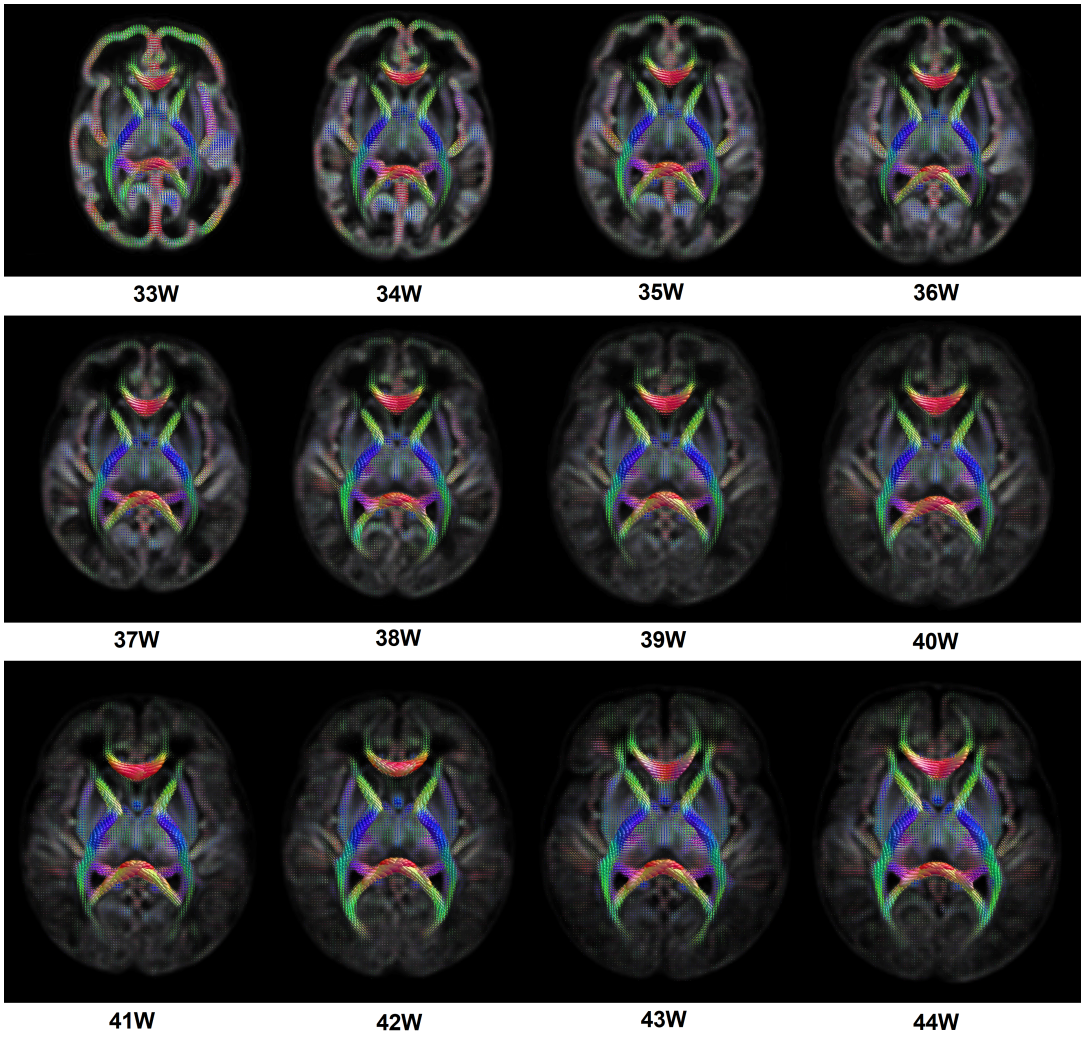

FIGURE 1 An axial slice from the FOD atlases for each of the postmenstrual ages between 33 and 44 weeks considered in this study.

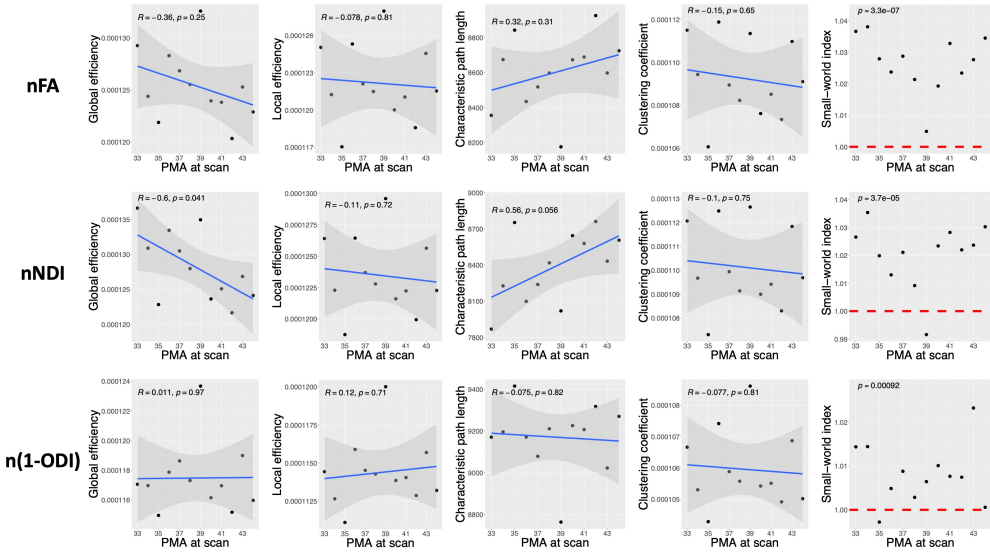

FIGURE 2 Plots of different structural connectivity measures, computed with the parcellation nodes defined with the ENA50 atlas, versus PMA for the connectome edge weighting based on FA, NDI, and 1-ODI. In these plots, the connectomes for each weighting scheme have been normalized such that the total connectome strength is the same for all PMAs.

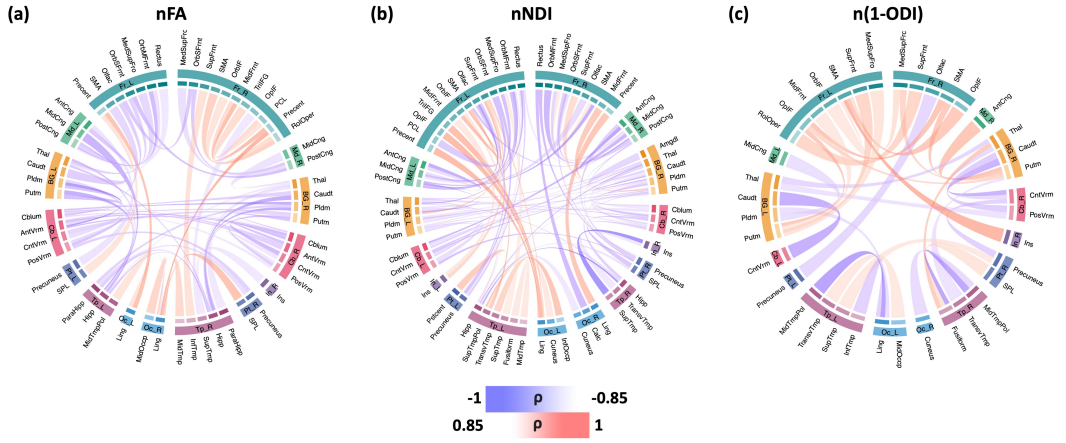

FIGURE 3 The association between connection strength and PMA in the connectomes normalized by the total network strength. The association is quantified in terms of Spearman's rank correlation coefficient (ρ) after Bonferroni correction. The color intensity of the edges is proportional to ρ.

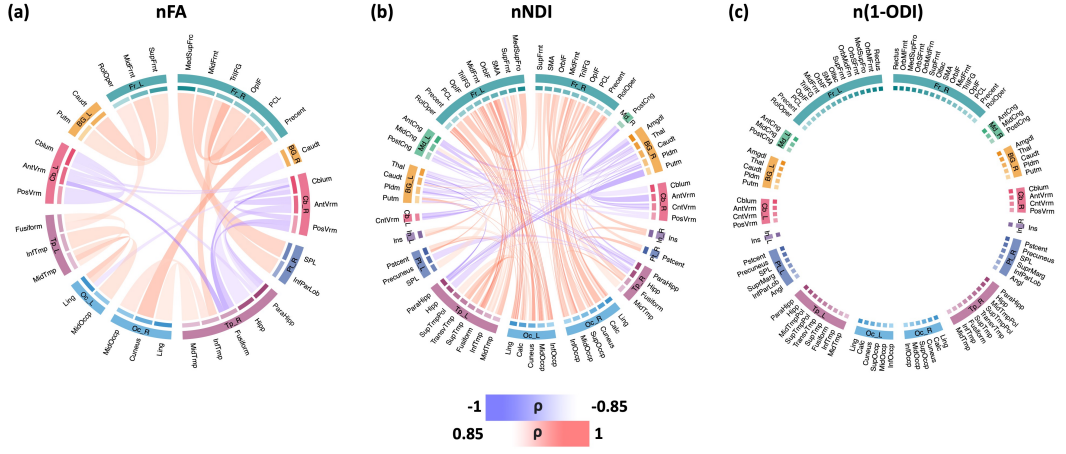

FIGURE 4 The association between connection strength and PMA in the connectomes normalized by the total network strength for the length-preserved connectome averaging method. The association is quantified in terms of Spearman's rank correlation coefficient (ρ) after Bonferroni correction. The color intensity of the edges are proportional to ρ.

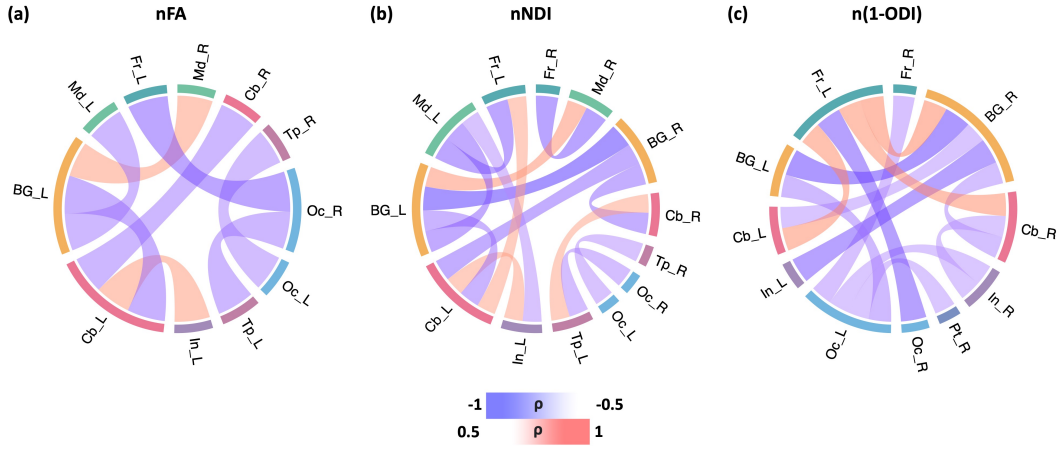

FIGURE 5 Lobe-wise connections that are significantly correlated with PMA in the connectomes that have been normalized in terms of the total network strength. These connectomes show the Spearman's rank correlation coefficient (ρ) after FDR correction. The color intensity of the edges is proportional to ρ.

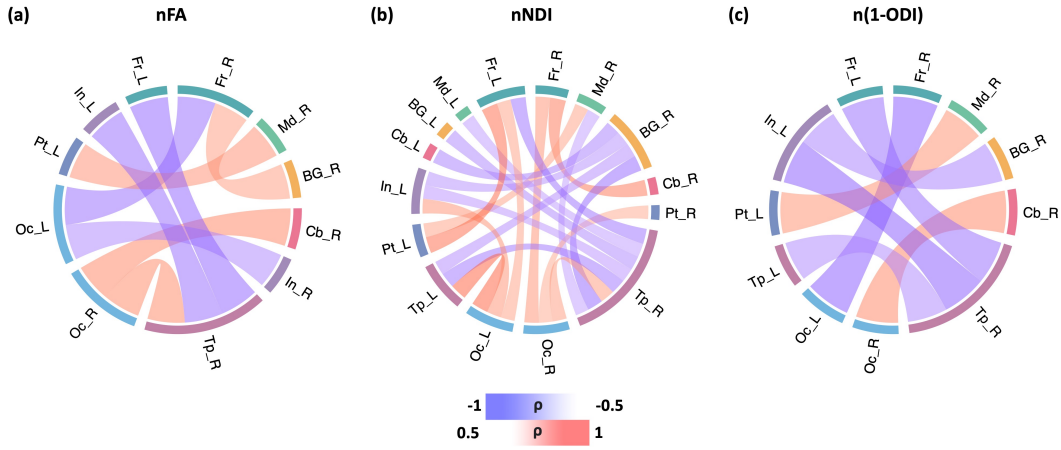

FIGURE 6 Lobe-wise connections that are significantly correlated with PMA for the length-preserved connectome averaging method. In these plots, the connectomes are normalized in terms of the total network strength. They show the Spearman's rank correlation coefficient (ρ) after FDR correction. The color intensity of the edges are proportional to ρ.

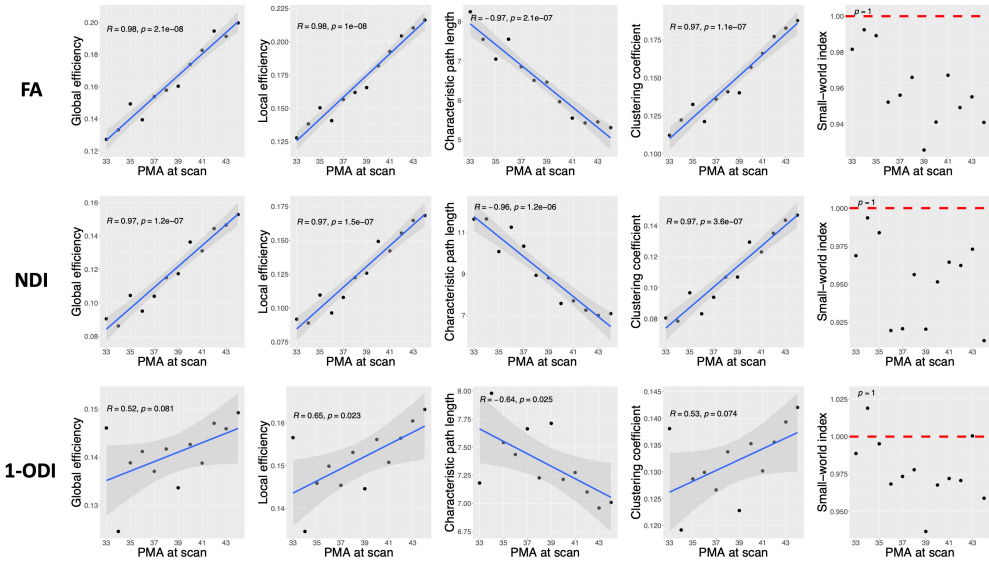

FIGURE 7 Plots of different structural connectivity measures, computed with the parcellation nodes defined with the UNC FC atlas, versus PMA for the connectome edge weighting based on FA, NDI, and 1-ODI.

TABLE 3 Summary of the PMA regression results. *ENA50* column shows the results of our proposed method with the parcellation nodes defined with the ENA50 atlas. *ENA50 - normalization* column presents the same, but with normalizing the connectomes across PMA to have the same total strength. *UNC FC* column shows the results of our method with the parcellation nodes defined by the UNC FC atlas. Lastly, *Connectome averaging* column presents the results of connectome-level averaging based on the length-preserved method.

		ENA50		**ENA50 - normalization**		**UNC FC**		**Connectome averaging**	
		p-value	R	*p-value*	R	*p-value*	R	*p-value*	R
	GE	<0.0001	0.9854	0.2509	-0.3596	<0.0001	0.9805	<0.0001	0.9777
	LE	<0.0001	0.9858	0.8090	-0.0782	<0.0001	0.9832	<0.0001	0.9699
FA	CPL	<0.0001	-0.9728	0.3099	0.3204	<0.0001	-0.9691	<0.0001	-0.9603
	CC	<0.0001	0.9772	0.6522	-0.1453	<0.0001	0.9729	<0.0001	0.9753
	SWI	<0.0001	/	<0.0001	/	1.0000	/	<0.0001	/
	GE	<0.0001	0.9813	0.0407	-0.5964	<0.0001	0.9725	<0.0001	0.9829
	LE	<0.0001	0.9794	0.7249	-0.1137	<0.0001	0.9713	<0.0001	0.9770
NDI	CPL	<0.0001	-0.9730	0.0560	0.5642	<0.0001	-0.9563	<0.0001	-0.9700
	CC	<0.0001	0.9750	0.7465	-0.1045	<0.0001	0.9656	<0.0001	0.9798
	SWI	<0.0001	/	<0.0001	/	1.0000	/	0.0074	/
	GE	0.0111	0.7008	0.9719	0.0114	0.0809	0.5232	0.4092	0.2628
	LE	0.0144	0.6826	0.7136	0.1186	0.0233	0.6458	0.6256	0.1572
1-ODI	CPL	0.0140	-0.6850	0.8164	-0.0752	0.0247	-0.6409	0.3283	-0.3091
	CC	0.0353	0.6098	0.8113	-0.0773	0.0740	0.5335	0.8440	0.0638
	SWI	0.0020	/	0.0009	/	0.9982	/	<0.0001	/